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COLOUR CODING OF SANDS AND CLAYS FROM THE SIMPSON DESERT DUNEFIELD ACCORDING TO MUNSELL SOIL COLOUR CHARTS

GEOLOGICAL SURVEY

by

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ABSTRACT

Samples of sand and clay, collected by Mr C.H. Mills from the dunefield of the Simpson Desert, were colour coded by reference to Munsell Charts issued by the United States Department of Agriculture. Colours varied from red to light brownish grey and were ascribed to the dominance of limonite coatings on sand grains, to uncoated grains and to various proportions of clay both as coatings on sand grains and as the matrix of the sample. No clay pellets were observed. Algal mats bound sand grains but did not introduce a recognisable bias to the distribution of grain size.

INTRODUCTION

A collection of surface samples was made by Mr C.H. Mills of the Department of the Environment on a traverse across the Simpson Desert. On the crests and slopes of dunes the samples were of unconsolidated sand and loosely-bound sand in algal mats. The samples from swales between the dunes consisted of sand and clay in various proportions. The margins of clay pans were also sampled and clay predominated, often to the almost complete exclusion of sand.

Variation in the colour of dune samples has been ascribed to differing proportions of sand grains with limonite coatings and of clay pellets derived by wind afflation of deliquescent material on the surface of saline clay pans. No clay pellets were observed in the samples collected and colour appeared to be controlled by the relative proportions of sand with limonite coatings and sand which is either uncoated or coated with clay.

The effect of algal mats on the distribution of grain size in the sands was tested by Amdel (Report No. F 6071 of November 1984) on the instructions of Mr R.A. Callen of the Regional

Geology Branch of S.A.D.M.E. Size distribution was measured on several samples before and after destruction by various methods of the algal mats. After statistical analysis it was concluded that the algal mats retained a representative sample of the sand and that their presence did not introduce a systematic error in grain size distribution.

The geographical distribution of colour changes was determined by comparison of the samples with standard colour chips in the Munsell soil colour charts prepared by the United States Department of Agriculture. The colour coding is given below.

RESULTS

Munsell Colour Coding of Simpson Desert Samples

Field Number	RS Number	Munsell Code
SD 1 82	6145 RS 41	Red 2.5 YR 5/6
SD 2 82	6145 RS 42	Red 2.5 YR 4/6
SD 3 82	6145 RS 43	Brown 7.5 YR 5/4
SD 4 82	6145 RS 44	Reddish brown 5 YR 4/4
SD 5 82	6145 RS 45	Red 2.5 YR 5/6
SD 6 82	6145 RS 46	Red 2.5 YR 4/8
SD 7 82	6145 RS 47	Reddish brown 2.5 YR 4/4
SD 8 82	6145 RS 48	Red 2.5 YR 4/6
SD 9 82	6145 RS 49	Red 2.5 YR 4/6
SD 10 82	6445 RS 18	Red 2.5 YR 4/6
SD 11 82	6445 RS 19	Red 2.5 YR 5/6
SD 12 82	6245 RS 3	Reddish brown 5 YR 4/4
SD 13 82	6245 RS 4	Red 2.5 YR 4/6
SD 14 82	6245 RS 5	Red 2.5 YR 4/8
SD 15 82	6245 RS 6	Reddish brown 2.5 YR 5/4
SD 16 82	6245 RS 7	Reddish brown 2.5 YR 4/4
SD 17 82	6245 RS 8	Red 2.5 YR 4/6
SD 18 82	6245 RS 9	Red 2.5 YR 4/6
SD 19 82	6345 RS 1	Red 2.5 YR 4/6
SD 20 82	6345 RS 2	Red 2.5 YR 5.6
SD 21 82	6345 RS 3	Red 2.5 YR 5/6
SD 22 82	6345 RS 4	Red 2.5 YR 5/6
SD 23 82	6345 RS 5	Yellowish red 5 YR 5/6
SD 24 82	6345 RS 6	Yellowish red 5 YR 5/8

SD	25	82	6345	RS	7	Yellowish red 5 YR 5/6
SD	26	82	6345	RS	8	Yellowish red 5 YR 5/6
SD	27	82	6345	RS	9	Reddish brown 5 YR 5/4
SD	28	82	6445	RS	20	Very pale brown 10 YR 7/3
SD	29	82	6445	RS	21	Light brown 7.5 YR 6/4
SD	30	82	6444	RS	1	Reddish yellow 7.5 YR 6/6
SD	31	82	6444	RS	3	Reddish yellow 7.5 YR 6/6
SD	32	82	6444	RS	4	Reddish yellow 7.5 YR 6/6
SD	33	82	6444	RS	5	Reddish yellow 7.5 YR 6/6
SD	34	82	6444	RS	6	Reddish yellow 7.5 YR 6/6
SD	35	82	6444	RS	7	Light brown 7.5 YR 6/4
SD	36	82	6445	RS	22	Light brown 7.5 YR 6/4
SD	37	82	6445	RS	23	Yellowish red 5 YR 5/6
SD	38	82	6345	RS	10	Yellowish red 5 YR 5/6
SD	39	82	6345	RS	11	Yellowish red 5 YR 5/6
SD	40	82	6344	RS	1	Reddish yellow 7.5 YR 6/6
SD	41	82	6443	RS	2	Yellowish red 5 YR 5/6
SD	42	82	6443	RS	3	Strong brown 7.5 YR 5/6
SD	43	82	6444	RS	8	Very pale brown 10 YR 7/3
SD	44	82	6444	RS	9	Strong brown 7.5 YR 5/6
SD	45	82	6344	RS	3	Yellowish red 5 YR 5/6
SD	46	82	6344	RS	4	Strong brown 7.5 YR 5/6
SD	47	82	6344	RS	5	Reddish yellow 7.5 YR 6/6
SD	48	82	6344	RS	10	Reddish yellow 5 YR 6/6
SD	49	82	6344	RS	6	Reddish yellow 5 YR 6/6
SD	50	82	5344	RS	7	Light brown 7.5 YR 6/4
SD	51	82	6344	RS	8	Light brown 7.5 YR 6/4
SD	52	82	6344	RS	9	Very pale brown 10 YR 7/4
SD	53	82	6445	RS	24	Reddish yellow 7.5 YR 6/6
SD	54	82	6445	RS	25	Light brown 7.5 YR 6/4
SD	55	82	6445	RS	26	Reddish yellow 5 YR 6/6
SD	56	82	6445	RS	27	Reddish yellow 5 YR 6/6
SD	57	82	6445	RS	28	Brownish yellow 10 YR 6/4
SD	58	82	6545	RS	1	Brown 7.5 YR 5/4
SD	59	82	6545	RS	2	Yellowish red 5 YR 5/6
SD	60	82	6545	RS	3	Yellowish red 5 YR 5/6
SD	61	82	6545	RS	4	Yellowish red 5 YR 5/6
SD	62	82	6545	RS	5	Strong brown 7.5 YR 5/6
SD	63	82	6545	RS	6	Light brown 7 5 YR 6/4
SD	64	82	6545	RS	7	Light yellowish brown 10 YR 6/4

SD	65	82	6545 RS	8	Light brown 7.5 YR 6/4
SD	66	82	6544 RS	3	Light yellowish brown 10 YR 6/4
SD	67	82	6544 RS	4	Reddish yellow 7.5 YR 6/4
SD	68	82	6544 RS	5	Light yellowish brown 10 YR 6/4
SD	69	82	6544 RS	6	Light yellowish brown 10 YR 6/4
SD	70	82	6544 RS	7	Yellowish red 5 YR 5/6
SD	71	82	6544 RS	8	Brown 7.5 YR 5/4
SD	72	82	6543 RS	1	Pale brown 10 YR 6/3
SD	73	82	6543 RS	2	Light brownish grey 2.5 YR 6/2

DISCUSSION

There is a general trend in the colour of samples from red in the north west to pale brown in the south east of the dune field but not every sample conforms to the trend. Shades of red are produced by limonite coatings on sand grains and pale browns and greys by clay as a grain coating or matrix. Uncoated quartz grains are neutral in colour. The tendency for samples from swales to be paler than those from dune crests is detectable but weak. There is no recognisable difference in the colour of swale and crest in many dunes.

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